DOCUMENT RESUME

ED 293 269 EC 202 468

AUTHOR Thurlow, Martha L.; And Others
TITLE Student Cognitions: Implications for Effective Instruction of Handicapped Students. Monograph No. 6. Instructional Alternatives Project.
INSTITUTION Minnesota Univ., Minneapolis.
SPONS AGENCY Office of Special Education and Rehabilitative Services (ED), Washington, DC.
PUB DATE May 87
GRANT G008430054
NOTE 35p.; For related documents, see EC 202 465-467.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Attribution Theory; *Classroom Environment; *Cognitive Processes; Cognitive Restructuring; Elementary Secondary Education; Intervention; *Mild Disabilities; Opinions; Self Concept; *Student Attitudes; Student Motivation; *Teacher Effectiveness; Teacher Student Relationship

ABSTRACT

The monograph summarizes research on students' beliefs or ideas about: (1) teachers' instructional behavior, (2) cognitive processes used during instruction, (3) differential treatment by teachers, (4) attributions for student performance, and (5) classroom learning environments. Students' cognitions or thought processes during instruction are considered to be a critical intervening variable between the teacher's delivery of instruction and student achievement. Three major implications for assessment and instructional intervention for mildly handicapped students are addressed: (1) there is evidence that assessment of the relationship between student attention and achievement should include student self-report; (2) teachers should use student interpretations and information to improve instructional effectivenness; and (3) when students are consistently unengaged or exhibit high rates of off-task behavior, teachers should check the appropriateness of the instructional match and student beliefs about their ability to succeed. Fifty-five references are appended. (Author/DB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED293269

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

University of Minnesota

## MONOGRAPH NO. 6

# STUDENT COGNITIONS: IMPLICATIONS FOR EFFECTIVE INSTRUCTION OF HANDICAPPED STUDENTS

Martha L. Thurlow, James E. Ysseldyke, and
Sandra L. Christenson

## INSTRUCTIONAL ALTERNATIVES PROJECT

May, 1987

EC202468



"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
James Ysseldyke
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Abstract

This monograph is a review of students' beliefs or ideas about (a) teachers' instructional behavior, (b) cognitive processes used during instruction, (c) differential treatment by teachers, (d) attributions for student performance, and (e) classroom learning environments. Students' cognitions or thought processes during instruction are considered to be a critical intervening variable between the teacher's delivery of instruction and student achievement. Implications for assessment and instructional intervention for mildly handicapped students are addressed.

This project was supported by Grant No. G008430054 from the U.S. Department of Education, Office of Special Education and Rehabilitative Services (OSERS). Points of view or opinions do not necessarily represent official position of OSERS.

## Student Cognitions: Implications for Effective Instruction of Handicapped Students

The Instructional Alternatives Project is a series of investigations aimed at assessing the effectiveness of alternative methodologies for increasing academic engaged time and academic outcomes for mildly handicapped students. The purpose of this monograph is to summarize what literature reviews and selected studies in the area of student cognitions have to say, or suggest, about effective instruction for mildly handicapped students. This area is just one of many that provide a basis for characterizing the qualitative nature of instruction for handicapped students.

For the past decade, educational psychologists have paid considerable attention to the relationship between time and school learning. Building on the seminal work of Carroll (1963) and subsequent work by Bloom (1974), researchers have conducted major investigations of the relationship between opportunity to learn (variously called academic engaged time, academic learning time, academic responding time, or time on task) and instructional outcomes. Now, in the past few years, the need to go beyond quantitative measures of engaged time to investigate what students do during that engaged time, or the qualitative nature of instruction, is increasingly recognized. Ours is one such effort.

Several comprehensive reviews of research on time and its relationship to school learning have been written (Anderson, 1984; Graden, Thurlow, & Ysseldyke, 1982; Karweit, 1983). In general, researchers have demonstrated: (a) school and teacher differences in time allocated to instruction exist; when aggregated over the school year, large differences between schools and classrooms in opportunity to learn in various curriculum areas result; (b) students spend a relatively small percentage of the school day actively engaged in academics; (c)

the percentage of time engaged varies considerably across classrooms and across individual students within classrooms, resulting in large differences between students in time actively involved in learning; (d) engaged time rates depend on a variety of organizational factors (classroom management, class size, interruptions), content area, and the point in time during the instructional period; and (e) engaged time is consistently though moderately related to student achievement. In addition to the tremendous variation in use of classroom time, additional time used to make up for ineffective instruction is negatively correlated with achievement (Frederick & Walberg, 1980; Karweit, 1983).

Time-based research is criticized on several counts. First, it is said that attention is drawn away from the quality of learning and to the quantity of time spent learning. Confrey (1981) argues that what occurs during a time period, not simply accumulation of time, is most critical for student learning. Thus, assignment of "busywork" can result in high time-on-task rates for students without concomitant increases in learning. Karweit (1983) criticizes time research because: (1) time appears to be at most a moderate predictor of achievement, (2) teacher, student, and classroom variation in engaged time may not be as easily altered as suggested by Bloom (1980), and (3) large increases in instructional time may be required for reasonably small changes in achievement. In her review and re-analysis of studies of engaged time and achievement, she concluded that there is a consistent, but low, positive correlation ($r = .09$ to $.43$) between the two when initial ability is controlled. Thus, time and other variables share substantial common variance.

In general, time-based studies of school learning result in the overall conclusion that time is one factor, but not the sole factor, producing or

limiting student achievement. Simply stated, increased time is a necessary but not sufficient condition for improving student achievement. Several researchers echo the need to investigate other aspects of the qualitative nature of instruction. Consider the following:

> The value of future classroom research will improve if more attention is placed upon the quality of instruction and if research becomes more integrative, examining the teacher, students, and particular curriculum tasks in specific contexts. (Good, 1983, p. 129).

> Clearly it is the quality more than the quantity of schooling which best serves as an educational and research focus. Quality of schooling includes not only time on task, but time well spent. It also includes, however, time spent on teaching practices such as encouragement, corrective feedback with guidance, small group discussions, individualization, and students involvement in their own education; but not idle praise, corrective feedback without guidance, rambling verbal interactions, busywork as a controlled device, or token student making. (Sirotnik, 1983, p. 26)

> We need to move beyond the now well established relation between time on task/student engagement/teacher management skills and student learning...at this point we no longer need to replicate these findings; instead we need to go beyond them in order to observe other relations. (Brophy, 1979, p. 749)

An important aspect of the qualitative nature of instruction is the student's thoughts and perceptions about the instructional process. Good (1983) identified understanding student perceptions of tasks and directions as one of three ways to increase time on task and improve student achievement.

The qualitative nature of instruction has not received the attention for handicapped students that it has for nonhandicapped students. Since a primary goal of the Instructional Alternatives Project is to document the qualitative nature of instruction for handicapped students, a necessary first step was to review the relevant literature, literature that might directly address the issues related to instruction for handicapped students, or that at least would provide insights that might be relevant to students in the special education population.

In this endeavor, seven general areas of literature were identified. They are as follows:

Student Cognitions
Instructional Psychology
Models of School Learning
Effective Schools
Effective Instruction
Teacher Effectiveness
Teacher Decision Making

The first area is summarized in this monograph. Other areas are summarized in other monographs. In each literature review, we identified those factors that individuals say are important or that research has documented empirically to be related to positive academic outcomes. Based upon these literature reviews, over 100 factors were generated. These factors, organized into environmental, instructional, and student characteristics, were studied and the decision was made to focus on an analysis and description of instructional factors for assessing the qualitative nature of instruction. The procedure used to develop a scale for this purpose is described in Monograph No. 1 (Ysseldyke, Christenson, McVicar, Bakewell, & Thurlow, 1986).

In this monograph, literature reviews and selected studies are summarized in the area of student cognitions. The monograph concludes with a summary of the contributions this area makes to characterizing the nature of instruction and to identifying important variables for promoting positive student learning outcomes.

## Background

The thought processes or cognitions of students during instruction are believed to be a critical intervening variable between the teacher's delivery of effective instruction and student learning outcomes. In recent years, there has

been increased interest in student thought, action, and decision making as students engage in learning and in other classroom activities. This monograph focuses on a review of students' beliefs or ideas that result from their experiences with classroom instruction. It does not provide comprehensive coverage of research on student perceptions of schooling. Five primary topics related to student perceptions are covered: (a) teachers' instructional behavior, (b) cognitive processes used during instruction, (c) differential treatment by teachers, (d) attributions for student performance, and (e) classroom learning environments. Additional information is found in reviews by Wittrock (1986) and Weinstein (1983).

In research on student cognitions, influenced by the recognition that students have an impact on instruction and its outcomes as much as do teachers (Berliner, 1976; Doyle, 1977), a mediating-process paradigm is used to study teaching. In contrast to the process-product paradigm, in which researchers study how teachers or instructional practices directly contribute to student achievement, those who study students' thought processes examine how teaching or teachers influence what students think, believe, say, or do that, in turn, affects their achievement. The distinctive characteristic of this research is the belief that teaching affects achievement through student thought processes. Thus, teaching influences student thinking and student thinking mediates learning and achievement.

Recent research on student thought processes is both extensive and broad in scope. Wittrock (1986) emphasizes the critical role that student background knowledge, perceptions of instruction, attentional processes, motivation and attributions for learning, affective processes, learning strategies, and

metacognitive processes play in teaching and influencing student achievement. Similarly, Weinstein (1983) provides a comprehensive review of student perceptions of schooling, including a review of student perceptions about the teacher and teacher behavior, peers and peer behavior, other school personnel, him/herself in school, the causes of behavior in school, the classroom, and the school. In turn, each of these areas is subdivided; for example, the review of research on student perceptions of the classroom includes a review of classroom climate studies and research on understanding of a wide variety of classroom processes (e.g., perception of work, understanding of school time, resource allocation in the classroom, decision making in the classroom). The extensiveness of this area is highlighted by Weinstein's ERIC search of the literature since 1966, which revealed 515 papers concerned with elementary and secondary school students' perceptions of classroom phenomena. This number excludes the most extensively researched area, that of student perceptions of classroom learning environments (Fraser, 1980; Fraser & Walberg, 1981; Moos, 1979; Walberg, 1976).

## Student Perceptions of Teachers' Instructional Behavior

Until recently, much research on instruction focused on the relationship among teacher behaviors and measures of student learning (i.e., process-product studies of teaching). Therefore, less has been learned about the nature of students' responses to teaching events. In their reconceptualization of research on teaching, Winne and Marx (1977) argued that assumptions about students' responses, often obtained through observation, may not match the students' actual thinking processes. They suggested that it is necessary to ascertain the extent to which students engage in the psychological or thinking

process required by the teacher's behavior, before concluding that an instructional behavior performed by the teacher is ineffective in promoting learning. For example, before concluding that application questions asked by the teacher are ineffective in promoting learning, it is necessary to determine whether the students engage in the thinking processes intended by application type questions. Without data about students' thought processes or mediations of the teacher's questions, several rival hypotheses about the failure of the instructional behavior (e.g., asking application questions) to positively affect students' learning are possible: the students may have been inattentive to the teacher; the students may have heard the question, understood what was intended by it, but may have lacked either the knowledge to answer the question or the ability to use the appropriate cognitive process; or the students may have attended, understood, and been able to answer the teacher's questions, but chose not to do so. In this section we summarize student perceptions of effective instructional behavior and goals of instruction.

Students' Perceptions of Effective Instructional Behaviors

In an extensive program evaluation in the Little Rock School District, secondary level students identified teacher behaviors that they believed were most helpful for them to learn (Mosley & Smith, 1982). The five behaviors most often mentioned by the students in grades 7-12, in descending order of perceived importance were: (1) use of clear, complete explanations and concrete examples, including student-teacher questioning and review of materials and concepts, (2) provision of a positive, relaxed learning environment in which the teacher jokes and makes learning fun, but expects that the student will learn, (3) use of individualized instruction in order to accommodate different learning rates, (4)

adequate academic learning time, including an expectation that students will use instructional time wisely, and (5) motivation and interest factors, including teacher enthusiasm about the content being studied as well as providing a personal challenge for the students. The students' list is consistent with behaviors found effective in promoting learning outcomes (see Christenson, Thurlow & Ysseldyke, 1987), lending credence to the role of student perceptions. No data were found on elementary students' perceptions of effective instructional behaviors.

Students' Perceptions of the Goals of Instructional Tasks

The extent to which students understand the goals of instructional tasks is a critical issue in classroom learning. Researchers who analyzed detailed narrative records of observations of first-grade students during seatwork activities and student interviews found that the students believed that the teacher's goal was that they complete the work and progress through a book, not that they understand the specific content (Anderson, 1985). Since teachers' statements basically were procedural and omitted information about the content of the assignments, the authors concluded that either the first graders were accurate in depicting the intent of the teachers or were less able, as first graders, to perceive abstract levels of teacher intent.

Support for the notion that students learn to perceive the goals of instruction as a result of the directions received from teachers is found in research on teacher talk and student thought (Blumenfeld, Hamilton, Bossert, Wessels, & Meece, 1983). In their study with elementary school students, Blumenfeld et al. found that teachers' comments and directions about academic performance, which also included effort attributions as a way to succeed,

correlated more highly with students' thoughts than did teacher talk about social procedures or socialization of the student in the school and society. Teachers who focus on academic work and students' responsibility for completing work through student effort convey a task-oriented classroom and a sense of primary importance for intellectual activities.

There is evidence that when teachers provide specific information on task goals and requirements, the academic performance of average and learning disabled students improves. In two related studies, Wong, Wong, and LeMare (1982) examined the influence of fifth, sixth, and seventh graders' perceptions of criterion task demands on their comprehension and recall of reading passages. In the first experiment, learning disabled and average achieving students were given explicit instructions about the types of comprehension questions that would appear on a test following their reading of a 400-500 word passage. Students in the control condition simply studied the passage for as long as they wanted. Knowledge of the comprehension task demands improved posttest performance over the control group for both learning disabled and average achieving students.

In the second study, explicit recall instructions that stressed studying particular features of the reading passage were provided to a different sample of learning disabled and average students in grades 5-7. Learning disabled and average students in the control condition were given vague, general task instructions. A significant group by knowledge of criterion task interaction was found. The learning disabled students who were given explicit knowledge of the criterion task recalled as much of the passage content as average students in the control condition. However, they did not recall as much as the average

students who were provided with explicit knowledge of task demands. Knowledge of the demands of the recall task significantly improved the recall performance of both learning disabled and average students when compared to those students in the control condition. The authors concluded that clear instruction about task demands significantly improves the performance of average and learning disabled students on comprehension and recall tasks.

## Student Perceptions of Cognitive Processes

Related to the topic of student perceptions of teachers' instructional behavior is student perceptions of cognitive processes used in the classroom. In this section, we summarize two separate programs of research directed by Peterson and Winne and Marx. Winne and Marx (1982) are involved in a program of research in which they are investigating students' perceptions of instructional stimuli in classroom instruction. Teachers' classroom presentations are comprised of the content to be learned and instructional stimuli. Teachers' assignments and tests represent the content to be learned; instructional stimuli are the ways in which teachers attempt to control their students' cognitive operations or thinking processes. The congruence between teachers' intentions for upper elementary students' cognitive processes and students' views of the cognitive processes intended by their teacher was assessed through structured teacher and student interviews while viewing videotapes of 50 25-45 minute classroom lessons in mathematics, science, language arts, and social studies. Teacher intentions for student cognitions were coded using a complicated system involving three major categories: orienting (the goals toward which students work), cognitive processing (the way students think during instruction to achieve the intended products, e.g., comprehension), and consolidating (practice

designed to achieve storage and retrievability of content). The authors concluded that there is not a one-to-one correspondence between instruction identified by the teacher and the cognitive processing it cues in students.

In addition to identifying mismatches between teacher intent and student perception of intent, this study revealed findings about students' perceptions of instructional stimuli that support the importance of Carroll's (1963) two factors: ability to understand instruction and quality of instruction. It was found that:

1. When teachers promote affective states in students (e.g., enjoyment), students focus primarily on the content of the tasks.
2. The success of teachers' instructional messages is influenced by the cognitive processing demands required of the student. When teachers cue a global unit such as a rule or complicated thinking strategy, students' perception of the instruction is variable. However, when the amount of the material is reduced or the cognitive processing demand made more simplistic and explicit, the students more often perceive the instruction as the teacher intends. Similarly, when students have a well-practiced cognitive response to an instructional stimulus, they more easily perceive and execute the teacher's intentions.
3. Students' ability to perceive the teacher's intent and carry out the cued cognitive processes depends on how well they know the material presented. The students' degree of prior knowledge is related to their accuracy in perceiving instructional stimuli.

Students' cognitive processes as mediators between teacher behavior and student achievement were examined in a series of studies by Peterson and her colleagues. Using the same data source, fifth and sixth graders' descriptions of their thought processes during mathematics instruction were reported in two studies (Peterson & Swing, 1982; Peterson, Swing, Braverman, & Buss, 1982). The researchers used a stimulated-recall technique in which students were shown videotaped segments of their math probability lesson and asked to describe what they were thinking during the lesson. Student attention, student understanding, student motivation, and use of varied cognitive strategies were studied. The students who reported good attention to task performed better on their seatwork problems. In these studies, the students' self-reports of attending correlated with success on the mathematics problems more highly than did classroom observers' reports of student attending. Controlling for ability differences, student reports of their understanding of the lesson (i.e., why and what they understood) were related positively to achievement. In addition, independent of ability, student reports of using specific cognitive strategies, rather than global strategies such as thinking or listening, also correlated with achievement. The specific strategies related to student achievement were "relating the information being taught to prior knowledge" and "trying to understand the teacher or a difficult problem." Finally, students' reports of motivational self-thoughts correlated positively with attitudes toward mathematics. The authors concluded that student perceptions and cognitions during instruction mediate the effect of instruction on student achievement. Other researchers have found that students' perceptions of instruction and the cognitive processes used in response to instruction are related to student achievement (Winne & Marx, 1982; Wittrock, 1986).

In a subsequent study, using similar procedures with a more diverse ethnic and socioeconomic population of fifth graders, Peterson, Swing, Stark, and Waas (1984) replicated some, but not all, of the previous findings. The relationship of math achievement, reported use of cognitive strategies, and affective measures with three measures of student attending (observer judgments, student answers to stimulated-recall interview questions, and student scores on an attending subscale) were examined. They found that student scores on the attending subscale were more consistently related to achievement, reported use of specific cognitive processes, and affective measures than were either observed student behavior or student reports during the stimulated-recall interview. Students with higher scores on the attending subscale tended to produce fewer negative self-statements, suggesting that motivation is an important mediator of attention and, ultimately, achievement. A significant and positive correlation was found between student scores on the attending subscale and the reported specific cognitive processes of "trying to understand teacher or problem" and "providing a good explanation of lack of understanding." The authors concluded that students with higher levels of attention are not merely listening passively.

The series of studies by Peterson and her colleagues support the notion that attention is not the same as observed time on task or time allocated for learning. They concluded that "observation of overt behavior during classroom instruction may be inadequate as a measure of student attention. An assessment of student cognitions may be a more valid measure of attention" (Peterson et al., 1984, p. 505).

Peterson and her colleagues also found that the total number of specific cognitive strategies reported by students was positively related to their

achievement. Specifically, students' reports of "trying to understand the teacher or problem" and "student checks answers" were significantly related to students' math seatwork scores and math achievement test scores. However, when ability was partialed out of the relationships between students' reported processes and cognitive outcome scores as measured by the Sequential Tests of Educational Progress (STEP), the relationships were no longer significant. The authors argue that the correlation between students' reported use of specific cognitive strategies and student achievement should not be considered unimportant simply because the effect appears to be due to ability. In their view, employing such specific cognitive strategies is, in fact, "the essence of ability."

In the research program directed by Peterson, cognitive processes that define ability and produce achievement are consistently suggested. Higher ability students are more inclined to attend to the lesson, use a variety of specific cognitive strategies, report problem-solving steps, and report that teacher overview promotes understanding. They report understanding the lesson, while low ability students give imprecise reasons for not understanding. As a result, Peterson et al. encourage the teaching of cognitive processes to facilitate learning. Support for their contention is evident in the work of various cognitive psychologists (cf. Gagne, 1977).

Additional support for reliance on student self report rather than observational data in reaching appropriate conclusions about the role of cognitive processes in academic outcomes is supplied by the German contribution to the Classroom Environment Study of the International Education Association (Helmke, Schneider, & Weinert, 1985). The purpose of the Classroom Environment

Study is to identify those quality of instruction and classroom management variables that are important predictors of cognitive and affective student outcomes. In this study, quality of instruction is measured by the frequency of teacher cues facilitating student comprehension and the teacher's ability to ask clear and understandable questions (i.e., instructional clarity). Employing causal modeling data analysis techniques, Helmke and colleagues found that student-perceived quality of instruction (both cues and clarity) for elementary students was positively related to student engagement (.28), whereas observed quality of instruction had a strong negative relationship to student engagement (-.47).

Students' perceptions of instruction, in general, and of instructional stimuli, in particular, are important. These studies support the notion that attention is not the same as observed time on task or time allocated for learning. Individuals (Peterson et al., 1984; Wittrock, 1986) argue that students' constructive use of time, or the quality of time students spend attending to the academic task may be as important, or perhaps even more important, than quantity of time. Furthermore, when researchers use only classroom observation schedules to study teaching-learning relationships, they may get a misleading picture of how students learn from teaching. Since students construct meaning for classroom activities, the relationship between students' perceptions of instruction and their achievement and attitudes must be examined (Marx, 1983).

## Student Perceptions of Differential Treatment by Teachers

Much research on teachers' differential behavior toward high and low achievers has been conducted and summarized by Good and Brophy (1984). This

research is reported in our Monograph No. 4 (Christenson et al., 1987). While differences in teacher behavior toward high and low achievers are documented, there is considerable variance among teachers in the extent to which they are influenced by expectations and treat low and high achieving students differently. In an initial study, Brophy and Good (1970) examined the classroom behavior of four first grade teachers toward high and low achievers. While they found very few differences in the frequency of teacher contact, they also found important variations in the quality of teacher interaction with the two groups of students. Teachers were more likely to praise high achievers, to provide cues and repeat questions when high achievers made no response or answered incorrectly, and to criticize high achievers much less. The teachers were twice as likely to provide additional clues (i.e., persist in teaching) to high achievers. Following a correct response, low achievers were praised 6% of the time, compared to 12% for high achievers. Low achievers were criticized 18% of the time, whereas high achievers were criticized 6% of the time. In a subsequent study, teachers were unaware of both their differential treatment of high and low achievers, and their differential treatment among only high achievers. Other studies (Brophy & Good, 1974; Cooper & Good, 1982) indicate that teachers develop appropriate expectations for low achievers and treat them no differently than high achievers. The differences in the research findings may be explained in part by differences in teachers.

Student perceptions of differential treatment by teachers have been discussed in relation to student learning outcomes. Weinstein (1983) states:

> While differential treatment may directly affect student achievement gains without involving student interpretive processes (e.g., unequal opportunities to learn material) it is also possible that such differential treatment (if perceived) can inform students about expected behavior and in an indirect way can influence their performance, expectations, and motivation. (p. 292)

Students appear to discriminate differential treatment by teachers in the classroom. In a series of studies, Weinstein and her colleagues examined student perceptions of differential teacher treatment of high and low achievers. Weinstein and Middlestadt (1979) asked younger (grades 1-3) and older (grades 4-6) elementary students in regular classes to rate the extent to which 60 teacher behaviors are characteristic of treatment toward hypothetical male high achieving and low achieving students. Differential treatment of the high and low achiever was found for one-quarter of the teacher behaviors. For the high achieving male student, the students perceived teachers as having high expectations, high academic demands in granting special privileges, whereas the low achiever was perceived as receiving fewer chances to respond in class, but greater teacher concern and vigilance.

In a subsequent study, Weinstein, Marshall, Brattesani, and Middlestadt (1982) examined over 200 upper elementary students' perceptions of teacher behavior toward a hypothetical male and female high and low achiever. Both male and female low achievers were perceived as receiving more directions, rules, work, and negative feedback than high achievers, who were perceived as receiving higher teacher expectations for performance and success, more freedom and choice, and greater classroom opportunities. Similarly, students for whom teachers hold high expectations describe themselves as receiving less frequent criticism and more frequent praise than students for whom teachers hold low expectations (Cooper & Good, 1982). In this study, in contrast to the previous studies, students described their own treatment rather than that of a hypothetical high and low achiever. They rated nine teacher-student interactions as occurring more often, about the same amount, or less often than for classmates.

In a series of studies reported by Weinstein (1983), the relationship between upper elementary students' perceived differential treatment of high and low achievers by teachers and congruence of student and teacher expectations was investigated. Students' expectations more closely matched their teachers' expectations in those classrooms in which there existed high perceived differential treatment. Similarly, first grade boys identified as low achievers by their teachers had lower expectations for success at a new task compared to their average or high achieving peers (Stipek & Hoffman 1980). Weinstein's (1983) analysis of open-ended interviews with a subset of upper elementary students revealed that students use similar cues to form self-perceptions about their ability. They focus on teacher practices (largely feedback) and evaluations based on absolute standards. There is a greater percentage of "public cues" for poor performance reported by students in classrooms with high differential treatment. Thus, teacher expectations are a powerful predictor of student expectations and performance at both primary and intermediate grades.

Researchers studying differential treatment of students by teachers conclude that students perceive expectations of teachers and differentiate classroom treatment given to high and low expectation students. It is clear that students do not perceive teacher actions in the same ways. The teacher expectancy effect may occur with some students, but not with those who do not perceive teacher's differential treatment.

## Student Perceptions of Attributions for Student Performance

Students ascribe different causes for their behavior and school performance. The relationship between attributions and learning outcomes is well documented. In this section we begin with a discussion of an attributional

model, followed by empirical data for attributional retraining programs, and student perceptions of the causes of their academic behavior.

## Attributional Model

Those perceived causes most often researched in educational settings are ability, a stable, internal and uncontrollable cause; effort, an unstable, internal and controllable cause; luck, an unstable, external and uncontrollable cause; and task difficulty, a stable, external and uncontrollable cause (Weiner, 1979). In Weiner's model of attributional processes, it is hypothesized that students will be motivated to continue to learn or persevere when they attribute success or failure to their effort, or lack of it, rather than to forces over which they have little or no control. There is empirical evidence that motivational thought processes differentiate high and low achievers in schools and are useful for predicting school achievement (Bar-Tal, 1978). In addition, Wittrock (1986) contends that motivational variables help explain how teaching processes influence student thought processes that mediate achievement. He describes how the teaching process of reinforcement functions to enhance learning.

Contingent reinforcement functions to increase achievement by conveying to students that their effort produces learning in school. Success must be perceived to be caused by student effort or other student processes under self control. Thus, effort invested in learning is not sufficient for enhancing motivation unless the student perceives a causal relationship between his/her effort and his/her success or failure in school.

Attributional Retraining

Wittrock's contention that motivational variables are critical to understanding how teaching processes impact student thought is supported by results from attributional retraining programs. In a study of the effectiveness of an attributional retraining program (Dweck, 1975), elementary students with learned helplessness were taught to take responsibility for their failures in school by attributing them to a lack of sufficient effort rather than to ability. The academic performance of this group was contrasted with another group of students with learned helplessness who were given a success only training program. The academic performance of those students given the attribution retraining program was maintained or improved, whereas the achievement of the other group of students declined. In a study of sex differences in learned helplessness (Dweck, Davidson, Nelson, & Enna, 1978), girls demonstrated learned helplessness more often than boys. It was observed that teachers provided differential criticism; they frequently criticized boys for nonintellectual behavior and for a lack of effort, whereas girls were criticized primarily for intellectual activities. The authors hypothesized that due to differential criticism, boys attribute failure to lack of effort and girls attribute failure to lack of ability. When this same group of boys and girls was exposed to either a teacher-boy pattern (i.e., lack of effort) or a teacher-girl pattern (i.e., lack of ability) of work-related criticism, those students receiving the teacher-girl treatment, regardless of sex, attributed failure to lack of ability.

Student Perceptions of the Causes of Their Academic Behavior

Learning disabled children's attributions for success and failure have been investigated (Pearl, Bryan, & Donahue, 1980). Attributions made by learning disabled elementary students differ from those made by average students. In general, learning disabled students attribute success to luck and less to ability, and failure more to ability and less to lack of effort. Thus, attributions of learning disabled students are like those of students whose performance deteriorates after failure.

Rohrkemper and Bershon (1984) investigated the causes of problem difficulty of upper elementary students in regular classes. Specifically, they studied students' understanding of the nature and causes of problem difficulty and the effects of that difficulty on their thoughts and feelings as math students. The researchers focused on degree of task engagement and what students privately told themselves (i.e., use of inner speech) in solving math problems. Students' inner speech was grouped into three types of statements: self instructional statements (involves cognitive strategies), efficacy statements, and attribution and affective statements. Rohrkemper and Berohon analyzed taped structured interviews, categorizing student responses into a series of codes derived from theoretical positions and research in cognitive processes (e.g., use of cognitive strategies, attributional inferences).

In this study, most students indicated that they: (a) are able to tell when they do or do not understand problems, (b) do not identify poor instruction or inappropriate curriculum as the cause of problem difficulty, and (c) typically go to the teacher as the solution to mistaken understanding for completing a problem. When engaged in difficult tasks, students' inner speech

included both more self instructional and negative efficacy statements. On easy tasks, their inner speech changed. Cognitive strategies were absent and positive self efficacy or affective statements predominated. The authors concluded that the nature of inner speech varies with the difficulty of the task, that both teachers and students actively assign meaning and direct learning, and that task success is not the sole issue for engaging students in learning. Successful learning involves recovery from frustration and error correction; therefore, direct teaching and modeling of problem-solving strategies and coping techniques for students is hypothesized as important for increasing student achievement.

Consistent with the findings of Peterson et al. (1984), Rohrkemper and Bershon (1984) found that higher ability students were more aware than low ability students of not understanding a problem or procedure. While high ability students arrived at their awareness through thought processes (specifically, inner speech), lower ability students mentioned lack of familiarity as a cue to their lack of understanding. Lower ability students tended to have more negative expectations for future understanding and were more apt to expect resolution of the specific problems. Rohrkemper and Bershon discuss this finding in terms of Good's (1983) notion that lower ability students reflect a passive attitude toward school work. Lower ability students tend to rely on "outside sources" rather than on themselves, whereas higher ability students adopt a task-focused or active learner orientation, which is characterized by personal activation of information processing skills (cf. Corno & Mandinach, 1983). The authors argue that the quality of student task engagement is highly influenced by the teacher. In their view, the teacher is

the basic tool for helping students develop facilitative inner speech, which encompasses both learning and motivational constructs.

## Student Perceptions of Classroom Learning Environments

The impact of the classroom learning environment on student learning outcomes has been well documented in the literature (cf. Fraser, 1981). In this section we present a well researched model for understanding classroom environments (i.e., climate) followed by a summary of the literature on student perceptions of classroom environments.

### Classroom Environment Model

Moos has studied the effects of classroom, family and work environments on numerous outcome variables. As a result of his study of classroom environments, he developed both a model for characterizing the climate of a classroom and a system for measuring critical dimensions of the classroom environment (Moos, 1980). School and classroom contextual factors, physical and architectural features, organizational factors, teacher characteristics, and student characteristics are identified as the determinants of a classroom's social climate. The Classroom Environment Scale (Moos & Trickett, 1974) is used to assess three domains of classroom environments: relationship dimension, goal orientation dimension, and system maintenance and change dimension. The relationship dimension is an assessment of student involvement and teacher support for students; the goal orientation dimension is an assessment of the degree to which the classroom is academically oriented; and the system maintenance and change dimension is an assessment of class control and organizational variables.

Based on extensive research with elementary and secondary students, Moos (1980) found that elementary grade students made the greatest gains in reading and math classes that were characterized as warm, systematic, task oriented, and orderly. Gains on traditional achievement measures occurred most often with a combination of warm and supportive relationships, an emphasis on specific academic tasks, and an orderly, well-structured classroom. Each of the three learning environment dimensions are represented in academically achieving classes. Moos concluded that (1) basic skills programs need to be both supportive as well as task-oriented, and (2) while the teacher is important in creating a positive classroom learning environment, student characteristics affect the classroom milieu, particularly the teacher's emphasis on classroom control.

Student Perceptions of Classrooms

Fraser (1981) discussed students' perceptions of psychosocial characteristics of classrooms, including level of organization, degree of support and cooperation, task orientation, and general satisfaction. Student learning outcomes were found to be positively associated with student perceived cohesiveness, task difficulty, satisfaction, goal direction, democracy, and materials. Learning outcomes were negatively associated with friction, apathy, disorganization, and cliqueness.

Fraser reviewed a large number of predictive validity studies conducted in numerous countries and concluded that students' perceptions of classroom environments explained differences in student outcomes. For example, he cited Anderson and Wahlberg's studies that indicated students' perceptions of classroom environment accounted for between 13% and 46% of the variance in

cognitive, affective, and behavioral outcomes. A recent meta-analysis conducted by Wahlberg and Haertel (1980, reported by Fraser, 1981) validated this pattern of findings. These differences exist even when student entry characteristics, such as pretest scores and general ability, are controlled. Since the classroom environment is a major determinant of learning outcomes, Fraser advocates including classroom environment dimensions as predictors in future curriculum evaluation studies that attempt to evaluate curricula in terms of their impact on student learning.

There is congruence between the climate characteristics in instructionally effective schools (Lezotte, 1981) and students' perceptions of classroom environment characteristics that facilitate student achievement. Lezotte identified norms, beliefs, and attitudes that characterize the school learning climate of instructionally effective schools. Several characteristics of effective schools (a strong staff belief in the learning potential of all students, high sense of teacher self-efficacy, a commitment to teaching the essential cognitive skills, the importance of coordinated and strong instructional leadership from the principal, teacher autonomy for decision making within a professionally collaborative setting, and a task oriented, academic focus within the school) are remarkably similar to the cohesiveness, goal directedness, organization, and acceptance existing in classrooms valued by students.

## Contributions of the Literature on Student Cognitions to Understanding the Qualitative Nature of Instruction

Individuals investigating student cognitions consistently emphasize that students actively assign meaning to instruction delivered by the teacher. What

students think, feel, believe, understand, say, or do has a potential impact on the extent to which learning outcomes are positive. There are three major implications for educators who are planning for effective instruction. First, there is evidence that assessment of the relationship between student attention and achievement should include student self-report, particularly student understanding. Observers' reports of a student's classroom behavior were not as valid a measure of student attention as was student self-report. This kind of change in assessment practices could have ramifications for redefining student engaged time. Perhaps attending and thinking time (usually perceived as a passive activity to an observer) represent constructive use of student time. Perhaps the student is cognitively engaged.

The second implication, which is supported by Weinstein (1983), is for teacher use of student interpretations and information to improve instructional effectiveness. Teachers could use student interpretations to evaluate the extent to which: (a) they clearly articulated the goal of the lesson, (b) the student's thought processes match those intended by the teacher and the assigned tasks, (c) the student perceives a causal link between personal effort and success or failure in school, and (d) the teacher has set high, yet realistic expectations, particularly for low achieving students. It is not enough for teachers to deliver a well organized and sequenced lesson with clear task directions. Even with well developed, explicit lesson presentations, teachers cannot assume students, and handicapped students in particular, understand task demands or instructional goals as intended by the teacher. Teachers need to provide instructional support for student thought processes by asking students to explain "how" to perform tasks, directly teaching cognitive strategies,

reducing complexity of tasks, and modeling error correction procedures. Such teacher behaviors are particularly important for the handicapped population in order to increase student understanding and instructional outcomes.

Third, students who are consistently unengaged or exhibit high rates of off-task behavior should not automatically be stereotyped as having "motivational" problems. Rohrkemper and Bershon's (1984) finding that students' self-statements vary with the difficulty of math tasks suggests that the appropriateness of the instructional match is critical for maintaining task perseverance, which Carroll (1985) postulated is essential for active task engagement and the amount of time spent learning. When students are unengaged, the first step is for educators to check the instructional match, and students' beliefs about their ability to complete tasks successfully.

References

Anderson, L. M. (1985). What are students doing when they do all that seatwork? In C. W. Fisher & D. C. Berliner (Eds.), Perspectives on instructional time (pp. 189-202). New York: Longman.

Anderson, L. W. (1984). Time and school learning. New York: St. Martin's Press.

Bar-Tal, D. (1978). Attributional analysis of achievement-related behavior. Review of Educational Research, 48, 259-271.

Berliner, D. C. (1976). Impediments to the study of teacher effectiveness. Journal of Teacher Education, 27, 5-13.

Bloom, B. S. (1974). Time and learning. American Psychologist, 29, 682-688.

Bloom, B. S. (1980). The new direction in educational research: Alterable variables. Phi Delta Kappan, 61, 379-385.

Blumenfeld, P. C., Hamilton, V. L., Bossert, S. T., Wessels, K., & Meece, J. (1983). Teacher talk and student thought: Socialization into the student role. In J. Levine & M. C. Wang (Eds.), Teacher and student perceptions: Implications for learning. Hillsdale, NJ: Lawrence Erlbaum.

Brophy, J. (1979). Teacher behavior and its effects. Journal of Educational Psychology, 71, 733-750.

Brophy, J., & Good, T. (1970). Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. Journal of Educational Psychology, 61, 365-374.

Brophy, J., & Good, T. (1974). Teacher-student relationships: Causes and consequences. New York: Holt, Rinehart, & Winston.

Carroll, J. B. (1963). A model of school learning. Teachers College Record, 64, 723-733.

Carroll, J. B. (1985). The model of school learning: Progress of an idea. In C. W. Fisher & D. C. Berliner (Eds.), Perspectives on instructional time (pp. 29-58). New York: Longman.

Christenson, S. L., Thurlow, M. L., & Ysseldyke, J. E. (1987). Instructional effectiveness: Implications for effective instruction of handicapped students (Monograph No. 4). Minneapolis: University of Minnesota, Instructional Alternatives Project.

Confrey, J. (1981). Subject-matter specialists. Elementary School Journal, 82, 88-94.

Cooper, H. M., & Good, T. L. (1982). Pygmalion grows up: Studies in the expectation communication process. New York: Longman.

Corno, L., & Mandinach, E. (1983). The role of cognitive engagement in classroom learning and motivation. Educational Psychologist, 18, 88-108.

Doyle, W. (1977). Paradigms for research on teacher effectiveness. Review of Research in Education, 5, 163-198.

Dweck, C. (1975). The role of expectations and attributions in the alleviation of learned helplessness. Journal of Personality and Social Psychology, 31, 674-685.

Dweck, C. S., Davidson, W., Nelson, S., & Enna, B. (1978). Sex differences in learned helplessness: II. The contengencies of evaluative feedback in the classroom, and III. An experimental analysis. Developmental Psychology, 14, 268-276.

Fraser, B. J. (1980). Research on classroom learning environments in the 1970's and 1980's. Studies in Educational Evaluation, 6, 221-223.

Fraser, B. J. (1981). Learning environment in curriculum evaluation: A review. In B. H. Choppin & T. N. Posttehwaite (Eds.), Evaluation in education: An international review series, 5, 1-93.

Fraser, B. J., & Walberg, H. J. (1981). Psychosocial learning environments in science classrooms: A review of research. Studies in Science Education, 8, 67-92.

Frederick, W. C., & Walberg, H. J. (1980). Learning as a function of time. The Journal of Educational Research, 73, 183-194.

Gagne, R. M. (1977). The conditions of learning (3rd ed.). New York: Holt, Rinehart, & Winston.

Good, T. L. (1983). Classroom research: A decade of progress. Educational Psychologist, 18(3), 127-144.

Good, T., & Brophy, J. (1984). Looking in classrooms (3rd ed.). New York: Harper & Row.

Graden, J., Thurlow, M. L., & Ysseldyke, J. (1982). Academic engaged time and its relationship to learning: A review of the literature (Monograph No. 17). Minneapolis: University of Minnesota, Institute for Research on Learning Disabilities.

Harnischfeger, A., & Wiley, D. (1976). The teaching-learning process in elementary schools: A synoptic view. Curriculum Inquiry, 6, 6-43.

Helmke, A., Schneider, W., & Weinert, F. E. (1985). Quality of instruction and classroom learning outcomes. Results of the german contribution to the classroom environment study of the IEA (Paper 4). Munich: Max-Planck Institute for Psychological Research.

Karweit, N. L. (1983). Time on task: A research review (Report 332). Baltimore, MD: Center for Social Organization of Schools, Johns Hopkins University.

Lezotte, L. W. (1981). Climate characteristics in instructionally effective schools. Unpublished manuscript, Michigan State University.

Marx, R. W. (1983). Student perception in classrooms. Educational Psychologist, 18, 145-164.

Moos, R. H. (1979). Evaluating educational environments. San Francisco: Jossey-Bass.

Moos, R. H. (1980). Evaluating classroom learning environments. Studies in Educational Evaluation, 6, 239-252.

Moos, R. H., & Trickett, E. J. (1974). Classroom environment scale manual. Palo Alto, CA: Consulting Psychologists Press.

Mosley, M. H., & Smith, P. J. (1982). What works in learning? Students provide the answers. Phi Delta Kappan,

Pearl, R., Bryan, T., & Donahue, M. (1980). Learning disabled children's attributions for success and failure. Learning Disability Quarterly, 3, 3-9.

Peterson, P. L., & Swing, S. R. (1982). Beyond time on task: Students' reports of their thought processes during direct instruction. Elementary School Journal, 82, 481-491.

Peterson, P. L., Swing, S. R., Braverman, M. T., & Buss, R. (1982). Students' aptitude and their reports of cognitive processes during instruction. Journal of Educational Psychology, 74, 535-547.

Peterson, P. L., Swing, S. R., Stark, K. D., & Waas, G. A. (1984). Students' cognitions and time on task during mathematics instruction. American Educational Research Journal, 21, 487-515.

Rohrkemper, M., & Bershon, B. (1984). Elementary students' reports of the causes and effects of problem difficulty in mathematics. Elementary School Journal, 85, 127-147.

Sirotnik, K. A. (1983). What you see is what you get -- consistency, persistency, and mediocrity in classrooms. Harvard Educational Review, 53, 16-31.

Stipek, D., & Hoffman, J. (1980). Children's achievement related expectancies as a function of academic performance histories and sex. Journal of Educational Psychology, 72, 861-865.

Walberg, H. J. (1976). The psychology of learning environments. In L. S. Shulman (Ed.), Review of research in education (Vol. 4). Itasca, IL: Peacock.

Walberg, H. J., & Haertel, G. D. (1980). Validity and use of educational environmental assessments. Studies in Educational Evaluation, 6, 225-238.

Weiner, B. (1979). A theory of motivation for some classroom experiences. Journal of Educational Psychology, 71, 3-25.

Weinstein, R. S. (1983). Student perceptions of schooling. The Elementary School Journal, 83, 287-312.

Weinstein, R. S., & Middlestadt, S. E. (1979). Student perceptions of teacher interactions with male high and low achievers. Journal of Educational Psychology, 71, 421-431.

Weinstein, R. S., Marshall, H. H., Brattesani, K. A., & Middlestadt, S. E. (1982). Student perceptions of differential treatment in open and traditional classrooms. Journal of Educational Psychology, 74, 678-692.

Wiley, D., & Harnischfeger, A. (1974). Explosion of a myth: Quantity of schooling and exposure to instruction: Major educational vehicles. Educational Researcher, 3, 7-12.

Winne, P. H., & Marx, R. W. (1977). Reconceptualizing research on teaching. Journal of Educational Psychology, 69, 668-678.

Winne, P. H., & Marx, R. W. (1982). Students' and teachers' views of thinking processes for classroom learning. Elementary School Journal, 82, 493-518.

Wittrock, M. C. (1986). Student thought processes. In Handbook for research on teaching (3rd ed., pp. 297-314). New York: MacMillan.

Wong, B. Y., Wong, R., & LeMare, L. (1982). The effects of knowledge of criterion task on comprehension and recall in normally achieving and learning disabled children. Journal of Educational Research, 76, 119-126.

Ysseldyke, J. E., Christenson, S. L., McVicar, R., Bakewell, D., & Thurlow, M. L. (1986). Instructional environment scale: Scale development and training procedures (Monograph No. 1). Minneapolis: University of Minnesota, Instructional Alternatives Project.

## IAP PUBLICATIONS

Instructional Alternatives Project
350 Elliott Hall
University of Minnesota
75 East River Road
Minneapolis, MN 55455

### Research Reports

No. 1 Time allocated to instruction of mentally retarded, learning disabled, emotionally disturbed, and nonhandicapped elementary students by J. E. Ysseldyke, M. L. Thurlow, S. L. Christenson, & J. Weiss (March, 1987).

No. 2 Instructional tasks used by mentally retarded, learning disabled, emotionally disturbed, and nonhandicapped elementary students by J. E. Ysseldyke, S. L. Christenson, M. L. Thurlow, & D. Bakewell (March, 1987).

No. 3 Instructional grouping arrangements used with mentally retarded, learning disabled, emotionally disturbed, and nonhandicapped elementary students by J. E. Ysseldyke, M. L. Thurlow, S. L. Christenson, & R. McVicar (April, 1987).

No. 4 Academic engagement and active responding of mentally retarded, learning disabled, emotionally disturbed and nonhandicapped elementary students by J. E. Ysseldyke, S. L. Christenson, M. L. Thurlow, & R. Skiba (April, 1987).

### Monographs

No. 1 Instructional environment scale: Scale development and training procedures by J. E. Ysseldyke, S. L. Christenson, R. McVicar, D. Bakewell, & M. L. Thurlow (December, 1986).

No. 2 Instructional psychology and models of school learning: Implications for effective instruction of handicapped students by S. L. Christenson, J. E. Ysseldyke, & M. L. Thurlow (April, 1987).

No. 3 School effectiveness: Implications for effective instruction of handicapped students by M. L. Thurlow, S. L. Christenson, & J. E. Ysseldyke (May, 1987).

No. 4 Instructional effectiveness: Implications for effective instruction of handicapped students by S. L. Christenson, M. L. Thurlow, & J. E. Ysseldyke (May, 1987).

No. 5 Teacher effectiveness and teacher decision making: Implications for effective instruction of handicapped students by J. E. Ysseldyke, M. L. Thurlow, & S. L. Christenson (May, 1987).

No. 6 Student cognitions: Implications for effective instruction of handicapped students by M. L. Thurlow, J. E. Ysseldyke, & S. L. Christenson (May, 1987).

No. 7 Factors that influence student achievement: An integrative review by J. E. Ysseldyke, S. L. Christenson, & M. L. Thurlow (May, 1987).